CLAIMS

1. A device (30) for giving indications to the operator of a work machine, characterized in comprising:

a measurement device (20) for measuring the position of a construction surface, which is a current work object, and the position of other objects located in the vicinity of said construction surface, while said work machine is performing work;

a reference point detection unit (102) for detecting reference points corresponding to reference markers disposed in the vicinity of said construction surface, from the positions of the construction surface and the other objects measured by said measurement device;

a virtual line calculation unit (104) for calculating a virtual line corresponding to a target surface that is to be formed, on the basis of said reference points detected by said reference point detection unit;

a display data creation unit (110) for creating display data for displaying images indicating the positions of at least said construction surface and said virtual line, on the basis of said positions measured by said measurement device and said virtual line calculated by said virtual line calculation unit; and

a display device (34) for receiving said display data from said display data creation unit and displaying said images on a display screen.

2.   The device according to claim 1, characterized in that said display data creation unit (110) creates said display data in such a manner that an image which also depicts the position of said other objects in addition to the positions of said construction surface and said virtual line is displayed.

3.   The device according to claim 1, characterized in that said measurement device (20) is disposed in such a manner to move or turn direction in unison with said work machine, when said work machine moves or turns direction, whereby, even if said construction surface moves due to said work machine moving or turning direction, the positions of said construction surface and the other objects located in the vicinity of said construction surface are measured and an image indicating the positions of said construction surface and said virtual line is displayed.

4.   The device according to claim 1, characterized in that said measurement device (20) determines the positions of said construction surface and other objects on a continuous

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basis, whereby an image indicating the substantially real-time positions of said construction surface and said virtual line is displayed on the display screen.

5.   The device according to claim 1, characterized in that said reference point detection unit (102) detects a position satisfying prescribed geometrical conditions, from the positions of said construction surface and other objects measured by said measurement device, as said reference point.

6.   The device according to claim 1, characterized in that said reference point detection unit (102) detects a position specified by said operator, from the positions of said construction surface and other objects measured by said measurement device, as said reference point.

7.   The device according to claim 1, characterized in that said reference point detection unit (102) detects a plurality of positions from the positions of said construction surface and the other objects measured by said measurement device, as said reference points; and

said virtual line calculation device (104) calculates said virtual line in such a manner that said virtual line passes through said plurality of reference points thus detected.

8.   The device according to claim 1, characterized in further comprising: an acting component detection unit (106) for detecting the position of an acting component (6) which acts on said construction surface of said work machine;

wherein said display data creation unit (110) creates said display data in such a manner that an image which depicts the position of said acting component in addition to the positions of said construction surface and said virtual line, on the basis of the position of said acting component detected by said acting component detection unit.

9.   The construction target indicator device according to claim 8, characterized in that said acting component detection unit (106) detects the position of said acting component from the positions of said construction surface and said other objects measured by said measurement device.

10.   The device according to claim 9, characterized in further comprising an acting component position correction unit (108) for correcting the position of said acting component detected by said acting component detection unit, by means of a prescribed offset amount;

wherein said display data creation unit (110) creates said display data in such a manner that an image which

depicts the corrected position of said acting component in addition to the positions of said construction surface and said virtual line, on the basis of the position of said acting component corrected by said acting component position correction unit, is displayed.

11. The device according to claim 1, characterized in that displacement sensors for measuring the displacement of a plurality of components of said work machine are provided in said work machine; and

said acting component detection unit (106) detects the position of said acting component on the basis of the displacement of said plurality of components measured by said displacement sensors.

12. The device according to claim 1, characterized in that said display data creation unit (110) creates emphasized display data for displaying an emphasized image which shows an enlarged view of the positional error between said construction surface and said virtual line, in response to a request from said operator; and

said display device (34) displays said emphasized image by receiving said emphasized display data from said display data creation unit.

13. A device (30) for giving indications to the operator of a construction machine having a work machine, characterized in comprising:

a measurement device (20), which is installed on said construction machine in such a manner that said measurement device moves or turns direction in unison with said work machine, when said construction machine moves or said work machine turns direction, and which measures the positions of the construction surface forming the current work object and other objects located in the vicinity of said construction surface, while said work machine is performing work;

a reference point detection unit (102) for detecting reference points corresponding to reference markers disposed in the vicinity of said construction surface, from the positions of the construction surface and the other objects measured by said measurement device;

a virtual line calculation unit (104) for calculating a virtual line corresponding to a target surface that is to be formed, on the basis of said reference points detected by said reference point detection unit;

a display data creation unit (110) for creating display data for displaying images indicating the positions of at least said construction surface and said virtual line, on the basis of said positions measured by said measurement device

and said virtual line calculated by said virtual line calculation unit; and

a display device (34) for receiving said display data from said display data creation unit and displaying said images on a display screen.

14. A method for giving indications to the operator of a work machine, characterized in comprising the steps of:

measuring the position of a construction surface, which is a current work object, and the position of other objects located in the vicinity of said construction surface, while said work machine is performing work;

detecting reference points corresponding to reference markers disposed in the vicinity of said construction surface, from the measured positions of the construction surface and the other objects;

calculating a virtual line corresponding to a target surface that is to be formed, on the basis of said detected reference points; and

creating an image indicating the positions of at least said construction surface and said virtual line, on the basis of said measured position and said calculated virtual line, and displaying said image on the display screen.